DPM 152

Air Products and Chemicals, Inc.
Box 538, Allentown, PA 18105
Tel. (215) 481-4911 · TWX 510-651-3686
CABLE-AIRPROD · TELEX 84-7416

Air Products

Industrial Gas Division

Helium Material Safety Data Sheet

EMERGENCY PHONE: 800—523-9374 IN PENNSYLVANIA: 800—322-9092	TRADE NAME AND SYNONYMS Helium	CHEMICAL NAME AND SYNONYMS Helium
ISSUE DATE AND REVISIONS Issued: 13 April 1977 Rev: 16 February 1981	FORMULA He MW: 4.003	CHEMICAL FAMILY Inert gas

HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
Helium is a simple asphyxiant and has no threshold limit value (TLV).

SYMPTOMS IF INGESTED, CONTACTED WITH SKIN, OR VAPOR INHALED
Helium is odorless and nontoxic, but may produce suffocation by diluting the concentration of oxygen in air below levels necessary to support life. PERSONNEL, **INCLUDING RESCUE WORKERS,** SHOULD NOT ENTER AREAS WHERE THE OXYGEN CONCENTRATION IS BELOW 19%, UNLESS PROVIDED WITH A SELF-CONTAINED BREATHING APPARATUS OR AIRLINE RESPIRATOR. Exposure to oxygen-deficient atmospheres may produce dizziness, nausea, vomiting, loss of consciousness, and death. Death may result from errors in judgement, confusion, or loss of consciousness which prevents self-rescue. At low oxygen concentrations unconsciousness and death may occur in seconds without warning. Extensive tissue damage or burns can result from exposure to liquid helium or cold helium vapors.

TOXICOLOGICAL PROPERTIES
Helium is nontoxic but can act as a simple asphyxiant by displacing the amount of oxygen in air necessary to support life.

RECOMMENDED FIRST AID TREATMENT
Persons suffering from lack of oxygen should be moved to areas with normal atmosphere. SELF-CONTAINED BREATHING APPARATUS MAY BE REQUIRED TO PREVENT ASPHYXIATION OF RESCUE WORKERS. Assisted respiration and supplemental oxygen should be given if the victim is not breathing. If cryogenic liquid or cold boil-off gas contacts a worker's skin or eyes, frozen tissues should be flooded or soaked with tepid water (105-115F; 41-46C). DO NOT USE HOT WATER. Cryogenic burns which result in blistering or deeper tissue freezing should be seen promptly by a physician.

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	AUTO IGNITION TEMP	FLAMMABLE LIMITS	LEL	UEL
N/A	N/A	N/A	N/A	N/A

EXTINGUISHING MEDIA	ELECTRICAL CLASSIFICATION GROUP
N/A	N/A

SPECIAL FIRE FIGHTING PROCEDURES
N/A

UNUSUAL FIRE AND EXPLOSION HAZARDS
N/A

PHYSICAL DATA

BOILING POINT (°F.)	FREEZING POINT (°F)
@ 1 atm -452.1F (-268.9C)	@ 367 psia -458.0F (-272.0C)
VAPOR PRESSURE (psia)	SOLUBILITY IN WATER
N/A	@ 68F (20C), 1 atm 0.861% by volume

VAPOR DENSITY (lb/cu ft)	SPECIFIC GRAVITY (AIR = 1)	LIQUID DENSITY (lb/cu ft)	SPECIFIC GRAVITY (H_2O = 1)
@ 32F (0C), 1 atm 0.01114	@ 32F (0C), 1 atm 0.138	@ boiling point, 1 atm 7.798	@ boiling point, 1 atm 0.125

APPEARANCE AND ODOR
Helium is colorless and odorless in both the gaseous and liquid states.

DISCLAIMER

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REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		
	STABLE	X	None

INCOMPATIBILITY (Materials to avoid)	HAZARDOUS DECOMPOSITION PRODUCTS
None	None

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		
	WILL NOT OCCUR	X	None

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Avoid contact of skin with liquid helium or its cold boil-off gas. Flush liquid spill with water to disperse. Ventilate enclosed areas to prevent formation of oxygen-deficient atmospheres caused by evaporation of liquid helium or the release of gaseous helium.

WASTE DISPOSAL METHOD

Allow liquid helium to evaporate in a well ventilated location remote from work areas. Vent helium gas slowly to a well ventilated outdoor location remote from work areas. Do not attempt to dispose of residual helium in compressed gas cylinders. Return cylinders to Air Products with residual pressure, the cylinder valve tightly closed and valve cap in place.

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)

Use self-contained breathing apparatus in oxygen-deficient atmospheres. Caution! Respirators will not function. Use may result in asphyxiation.

VENTILATION	LOCAL EXHAUST	SPECIAL
Natural or mechanical where gas is present.	MECHANICAL (General)	OTHER Vents should be situated to avoid higher than normal concentration of helium in work areas.

PROTECTIVE GLOVES

(Liquid) Loose fitting gloves of impermeable material such as leather. Leather work gloves are recommended when handling compressed gas cylinders.

EYE PROTECTION

Safety glasses are recommended when handling high-pressure cylinders. Use chemical goggles or safety glasses when handling liquid.

OTHER PROTECTIVE EQUIPMENT

None

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION

Shipment of helium must be in accordance with Department of Transportation (DOT) regulations using DOT "NONFLAMMABLE GAS" label. Consult DOT regulations for details on the shipment of hazardous materials.

SPECIAL HANDLING RECOMMENDATIONS

Prevent contact of liquid helium or cold boil-off gas with exposed skin. Prevent entrapment of liquid in closed systems. Use only in well ventilated areas. Compressed gas cylinders contain helium at extremely high pressure and should be handled with care. Use a pressure-reducing regulator when connecting to lower pressure piping systems. Secure cylinders when in use. Never use direct flame to heat a compressed gas cylinder. Use a check valve to prevent back flow into storage container. Avoid dragging, rolling, or sliding cylinders, even for a short distance. Use a suitable hand truck. For additional handling recommendations on compressed gas cylinders, consult Compressed Gas Association Pamphlet P-1.

SPECIAL STORAGE RECOMMENDATIONS

Store liquid containers and cylinders in well ventilated areas. Keep cylinders away from sources of heat. Storage should not be in heavy traffic areas to prevent accidental knocking over or damage from passing or falling objects. Valve caps should remain on cylinders not connected for use. Segregate full and empty cylinders. Storage areas should be free of combustible material. Avoid exposure to areas where salt or corrosive chemicals are present. See Compressed Gas Association Pamphlet P-1 for additional storage recommendations.

SPECIAL PACKAGING RECOMMENDATIONS

Gaseous helium containers meet DOT specifications or American Society of Mechanical Engineers (ASME) codes. Liquid helium is stored in vacuum-insulated containers meeting DOT specifications or ASME codes.

OTHER RECOMMENDATIONS OR PRECAUTIONS

Liquid helium in exposed piping can actually cause air to condense and liquefy. The nitrogen in this liquid can evaporate more rapidly, leaving an oxygen enriched liquid behind. Utilize oxygen-compatible insulating materials and minimize exposed piping surface areas. Use only metals and materials compatible with extremely low temperatures. Avoid use of carbon steel and other metals which become brittle at low temperatures. Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder filled without the permission of the owner is a violation of Federal Law. If oxygen-deficient atmospheres are suspected or can occur, use oxygen monitoring equipment to test for oxygen-deficient atmospheres.

*Various Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full compliance.